Medical Spending on the U.S. Elderly

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Why Focus on the Medical Spending of the Elderly?

- Measurement of the elderly’s medical spending is particularly difficult
  - Nursing home expenses
  - End of life expenses
  - Our data are specifically designed to capture these expenses

Average medical expenditures for an American aged 65 or older were 2.6 times the national average (2010).

The population is aging fast.

A large share of this is paid for by the U.S. government.
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- The population is aging fast.
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Goals: We Wish to Answer

- Who pays for medical spending?
- Who receives medical care?
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- Who pays for medical spending?
- Who receives medical care?
- Why is U.S. medical spending so large?
  - Is it driven largely by expenditures for those at the top of the spending distribution/for those close to death?
  - Is the concentration of medical spending in the U.S. higher than in other countries?
The U.S. Health Care Market: Insurance

• Prior to age 65:
  • Insurance mostly provided privately, mainly through employers,
  • but many people uninsured.

• After age 65:
  • Virtually everyone is eligible for Medicare, a government-provided health insurance program – pays for most of the cost of hospital stays and doctor visits.
  • Medicaid (a means-tested program) pays for a big share of catastrophic expenses, like nursing home care.
  • But still lots of items not fully covered–many people have supplementary coverage.
  • Discontinuity in who pays for medical care at age 65.
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The U.S. Health Care Market: Supply

- Provision of health care (hospitals, nursing homes, pharmacies, doctors) is private.
  - Payment for health care mostly public after 65, provision of care mostly private ⇒ issues of cost containment
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- Payment for health care: governments and insurers use multiple approaches to limit costs:
  - Medicare: sometimes pay by diagnosis (e.g., hip/knee replacement).
  - Private insurers: negotiate prices with providers.
### Table: Funding Sources of the Elderly’s Personal Health Care Expenditures, 2010. Data from the National Health Expenditure Accounts.

<table>
<thead>
<tr>
<th>Payor</th>
<th>Hospitals</th>
<th>Professional Services</th>
<th>Nursing Care</th>
<th>Retail Drugs</th>
<th>Other</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out-of-pocket</td>
<td>1.1%</td>
<td>9.4%</td>
<td>28.2%</td>
<td>18.6%</td>
<td>27.9%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>13.4%</td>
<td>18.6%</td>
<td>7.8%</td>
<td>23.4%</td>
<td>3.8%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>6.8%</td>
<td>2.1%</td>
<td>29.7%</td>
<td>1.3%</td>
<td>21.9%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Medicare</td>
<td>69.7%</td>
<td>64.3%</td>
<td>24.3%</td>
<td>52.8%</td>
<td>36.5%</td>
<td>54.4%</td>
</tr>
<tr>
<td>Other</td>
<td>9.0%</td>
<td>5.6%</td>
<td>10.0%</td>
<td>4.0%</td>
<td>10.0%</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

- Medicare and Medicaid pay for over 65% of personal care expenditures.
  - Personal health care spending: total amount spent on all medical treatments for all individuals (excludes government R & D, public health, etc).
Data: Medicare Current Beneficiary Study, 1996-2010

- Survey of Medicare beneficiaries, includes virtually the entire age 65+ population
- Data of very high quality
  - Survey data are matched to Medicare administrative records
  - Includes information for those in nursing homes
  - Includes information of those right before death – children of deceased are asked about medical spending before death

De Nardi et al. (UCL, IFS, SUNY-Albany)

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- Captures about 82% of total medical spending of those age 65+
  - Captures about 85% of Medicare spending
  - Captures about 60% of Medicaid spending
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  - Captures about 85% of Medicare spending
  - Captures about 60% of Medicaid spending
## How Big are Mean Personal Care Expenditures?

<table>
<thead>
<tr>
<th>Income Quintile</th>
<th>Mean Income</th>
<th>Mean Medical Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Men</td>
</tr>
<tr>
<td>Everyone</td>
<td>24,000</td>
<td>27,080</td>
</tr>
<tr>
<td>Bottom</td>
<td>6,800</td>
<td>7,390</td>
</tr>
<tr>
<td>Fourth</td>
<td>12,110</td>
<td>13,630</td>
</tr>
<tr>
<td>Third</td>
<td>17,510</td>
<td>19,650</td>
</tr>
<tr>
<td>Second</td>
<td>25,520</td>
<td>28,350</td>
</tr>
<tr>
<td>Top</td>
<td>58,490</td>
<td>67,090</td>
</tr>
</tbody>
</table>

Table: Income and Total Medical Expenditures by all Payors, by Income Quintile and Gender.

- They are very big. Mean expenditures vary between $0.2 \times$ to $2.4 \times$ mean income, depending on income group.
- Mean annual medical spending on the low income is greater than for the high income
- The income gradient does not condition on health or age.
### Table: Mean Medical Expenditure by Income Quintile and Payor.

<table>
<thead>
<tr>
<th></th>
<th>Everyone</th>
<th>Bottom</th>
<th>Fourth</th>
<th>Third</th>
<th>Second</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>24,000</td>
<td>6,800</td>
<td>12,110</td>
<td>17,510</td>
<td>25,520</td>
<td>58,490</td>
</tr>
<tr>
<td>Medical Expenditures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Payors</td>
<td>11,980</td>
<td>14,770</td>
<td>12,680</td>
<td>11,210</td>
<td>10,710</td>
<td>10,530</td>
</tr>
<tr>
<td>Out-of-Pocket</td>
<td>2,330</td>
<td>2,110</td>
<td>2,360</td>
<td>2,300</td>
<td>2,330</td>
<td>2,550</td>
</tr>
<tr>
<td>Medicare</td>
<td>6,550</td>
<td>8,050</td>
<td>7,160</td>
<td>6,340</td>
<td>5,890</td>
<td>5,310</td>
</tr>
<tr>
<td>Medicaid</td>
<td>1,120</td>
<td>3,310</td>
<td>1,350</td>
<td>480</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>1,500</td>
<td>730</td>
<td>1,230</td>
<td>1,640</td>
<td>1,840</td>
<td>2,050</td>
</tr>
<tr>
<td>Other</td>
<td>490</td>
<td>580</td>
<td>580</td>
<td>460</td>
<td>430</td>
<td>390</td>
</tr>
</tbody>
</table>

- Out-of-pocket spending is nearly constant by income.
- Medicare is an important payor at every income quintile.
- Medicaid is much more income-based.
- Private insurance is much more important for higher income people.
### Measures of the Concentration of Medical Spending over 1, 2, and 3 Years.

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini coefficient on medical spending</td>
<td>0.67</td>
<td>0.61</td>
<td>0.58</td>
</tr>
<tr>
<td>Percentage spent by top 1% of spenders</td>
<td>11.9%</td>
<td>9.6%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Percentage spent by top 10% of spenders</td>
<td>52.0%</td>
<td>45.5%</td>
<td>42.7%</td>
</tr>
</tbody>
</table>

- Medical spending is concentrated among a few recipients.
Concentration of Medical Spending by Payor

<table>
<thead>
<tr>
<th>Spending Percentile</th>
<th>All Payors</th>
<th>Out-of-Pocket</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Spending</td>
<td>Percentage of total</td>
</tr>
<tr>
<td>Everyone</td>
<td>11,980</td>
<td>100.0%</td>
</tr>
<tr>
<td>top 10%</td>
<td>62,260</td>
<td>52.0%</td>
</tr>
</tbody>
</table>

**Table:** Medical Spending by Spending Percentile, MCBS. Results for each payor are sorted by that payor’s spending.

- Out-of-pocket spending far more uneven than total spending ⇒ public insurance does not eliminate medical expenditure risk.
- Does not include insurance premia
### Persistence of Total Medical Spending

#### Panel A: One year transition

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Bottom</th>
<th>Fourth</th>
<th>Third</th>
<th>Second</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>61.9</td>
<td>17.8</td>
<td>8.9</td>
<td>6.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Fourth</td>
<td>24.1</td>
<td>36.6</td>
<td>19.4</td>
<td>12.1</td>
<td>7.8</td>
</tr>
<tr>
<td>Third</td>
<td>9.8</td>
<td>25.4</td>
<td>32.3</td>
<td>21.0</td>
<td>11.5</td>
</tr>
<tr>
<td>Second</td>
<td>6.0</td>
<td>13.6</td>
<td>25.9</td>
<td>34.2</td>
<td>20.3</td>
</tr>
<tr>
<td>Top</td>
<td>3.5</td>
<td>6.6</td>
<td>11.9</td>
<td>24.3</td>
<td>53.8</td>
</tr>
</tbody>
</table>

#### Panel B: Two year transition

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Bottom</th>
<th>Fourth</th>
<th>Third</th>
<th>Second</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>58.3</td>
<td>17.6</td>
<td>10.3</td>
<td>7.5</td>
<td>6.3</td>
</tr>
<tr>
<td>Fourth</td>
<td>26.0</td>
<td>32.2</td>
<td>19.0</td>
<td>12.7</td>
<td>10.2</td>
</tr>
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<td>Third</td>
<td>11.9</td>
<td>25.6</td>
<td>28.3</td>
<td>20.5</td>
<td>13.8</td>
</tr>
<tr>
<td>Second</td>
<td>7.3</td>
<td>15.3</td>
<td>25.7</td>
<td>31.0</td>
<td>20.6</td>
</tr>
<tr>
<td>Top</td>
<td>4.7</td>
<td>8.5</td>
<td>13.5</td>
<td>25.1</td>
<td>48.2</td>
</tr>
</tbody>
</table>

- Shows percent of people in a given spending quintile at time $t+1$, $t+2$, given that they were in spending quintile $q$ at time $t$.
- Medical spending is very persistent over time, especially for those in the top and bottom tails of the spending distribution.
Figure: Average Total Medical Expenditure, by Age, with and without Adjustments for Cohort Effects.

- Medical spending rises rapidly after age 65.
- Especially so after adjusting for cohort effects and for women.
### Medical Spending in the Last Years of Life

<table>
<thead>
<tr>
<th></th>
<th>Mean Spending</th>
<th>As a percentage of aggregate spending</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total population</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(National Stats)</td>
</tr>
<tr>
<td><strong>Last years of life from data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year of death</td>
<td>36,340</td>
<td>4.9%</td>
</tr>
<tr>
<td>Next to last year</td>
<td>36,150</td>
<td>4.8%</td>
</tr>
<tr>
<td>Second to last</td>
<td>27,750</td>
<td>3.7%</td>
</tr>
<tr>
<td>Sum of last 3 years</td>
<td>100,240</td>
<td>13.4%</td>
</tr>
<tr>
<td><strong>Hoover et al. method</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final 12 months</td>
<td>49,910</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

Notes: Last year of life spending data from MCBS. Aggregate medical spending data are from HCEA, aggregate death data from National Vital Statistics Reports. All data are for 2008.

Average medical spending in 2008:

- U.S. total: $6,090
- Age 65+. National Statistics: $16,130, MCBS: $13,150
Measuring Medical Spending in the Last 12 Months of Life

Hoover et al. method

- Medical spending for the “year of death” mixes together those who died in January (one month of spending in the “year of death”) with those who died in December (12 months of spending).

\[ E_i = \beta_0 + \beta_1 \sqrt{m_i} + \beta_2 m_i + \beta_3 m_i^2 + \epsilon_i, \]

where \( E_i \) is total medical spending in the calendar year of death for individual \( i \), and \( m_i \) is individual \( i \)'s exact month of death.

- Dead in January \( \Rightarrow m_i = 1 \)
- Dead in December \( \Rightarrow m_i = 12 \)
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- Dead in January \( \Rightarrow m_i = 1 \)
- Dead in December \( \Rightarrow m_i = 12 \)
Figure: Spending in the Last 12 Months of Life, by Payor Type
Conclusions: Among the US Population Aged 65+

- The government pays for over 65% of personal care expenditures.
- Medical spending is very concentrated in the top 10% of recipients.
- At the top and the bottom end of the medical expense shocks, these expenses are very persistent over time.
- Medical expenses before death are high, but are a small fraction of total medical expenses of people over their life cycle. Thus,
  - They are not primarily responsible for large medical expenses in the U.S.